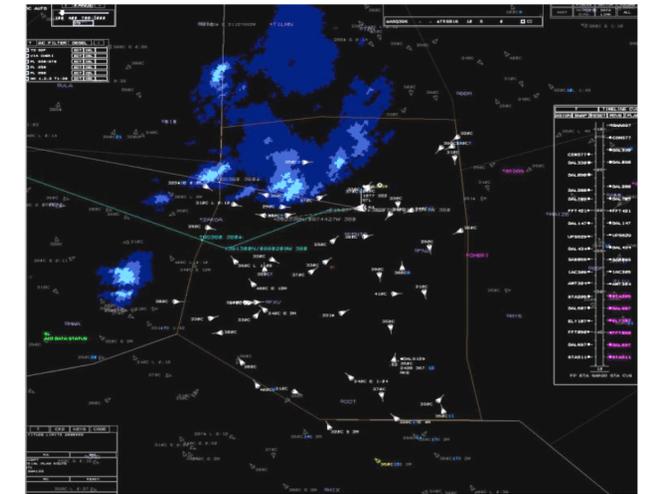
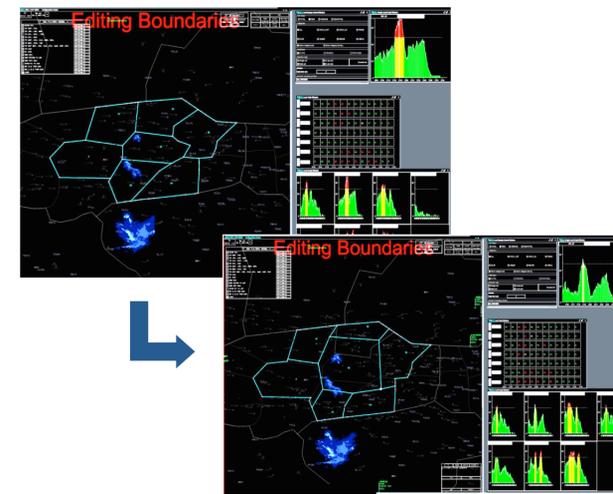
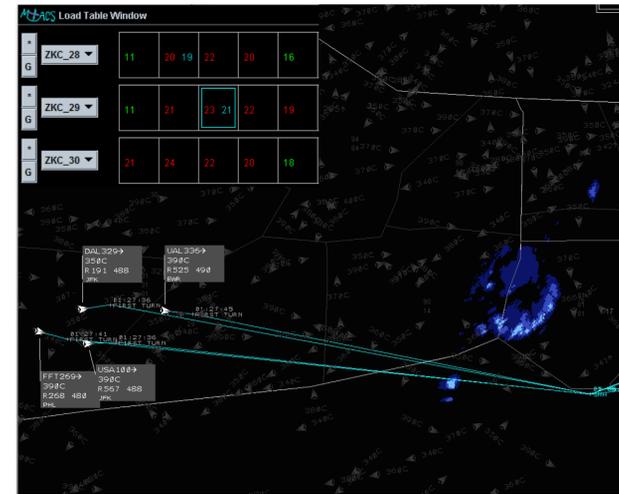




## Integration and Evaluation of Concepts and Technologies in the Airspace Operations Laboratory at NASA Ames: Flexible Airspace and Trajectory Management in the Mid- and Far-term

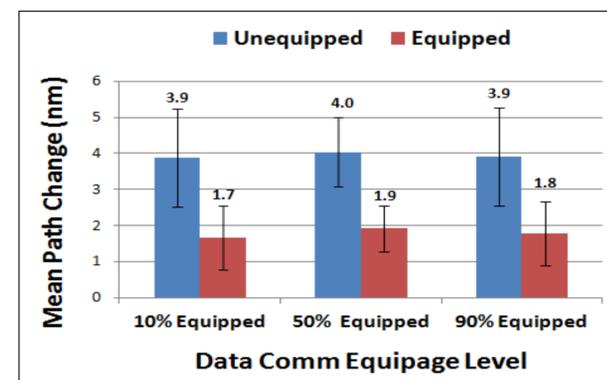


### Motivation

- Future concepts are being proposed to meet the forecast increase in airspace demand and the need for increased operational and flight efficiency.
- Proposed concepts are often stand-alone and do not offer an integrated solution of human-automation systems.
- The Airspace Operations Laboratory at NASA Ames specializes in prototyping concepts and technologies for NextGen and human-in-the-loop evaluation of integrated human-automation systems.

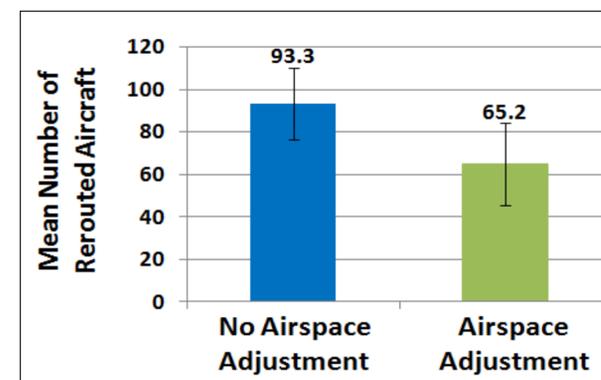
### Mid-Term: Trajectory Management

- Local flow adjustments that adapt to changing constraints can provide more efficient trajectories.
- New planning tools support flow-based trajectory modifications.
- Simulation results show shorter reroutes at all equipage levels for Data Comm. equipped aircraft providing service for equipage.



### Mid-Term: Flexible Airspace Management

- Demand-capacity imbalances are initially handled by delays and reroutes.
- Airspace boundaries can be adjusted to better distribute traffic and workload.
- Simulation results show fewer required reroutes, more efficient paths, and increased capacity.



### Far-Term Approach

- Greater support at the sector level has been tested through the ground-based automated separation assurance concept.
- Many routine administrative and separation tasks are performed by automation.
- Results show much higher levels of throughput without a related increase in workload.

